



Virtual Laboratory

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Project Objectives

- Educate students in the purpose, function, theory and use of sophisticated scientific instruments used in NASA research and engineering.
- Create the ability to become familiar with these instruments via immersive software that simulates the scientific exploration they support.
- Introduce students to the art and craft of using these instruments to solve problems.
- Provide a framework and technology for adding virtual instruments and virtual specimens.

Sample Use Cases

- A community college student exploring a career in microscopy interacts with the instrument descriptions and demonstrations provided by the Virtual Laboratory application or web site.
- The same student follows instructions to perform a failure analysis on a virtual failed component, varying the major parameters of a virtual x-ray microscope and then a virtual scanning electron microscope to determine the failure's root cause, avoiding any false clues.
- A biology student learns basic microscopy techniques by examining a virtual tissue sample and manipulating the controls of a virtual scanning electron microscope to best identify major intracellular structures.

Customers

- Undergraduate science, engineering and technology students, and advanced high school students.

Deliverables for Phase 1

- One software application that provides a student-driven investigative session with a virtual scanning electron microscope.
- Two virtual specimens to examine in the above application.
- Lesson plans and other user documentation that guides the student in the use of the above application and helps to ensure that the intended concepts are conveyed and understood.

Milestones for Phase 1

	<i>When</i>	<i>What</i>	<i>Confidence</i>
ET.2-L.2-LAB.1	1 Feb '03	Specification of the Phase 1 deliverables	Green
ET.2-L.2-LAB.2	1 Mar '03	Report of feedback from educator review	Green
ET.2-L.2-LAB.3	1 Apr '03	Final determination of academic or industry partners	Green
ET.2-L.2-LAB.4	15 Jul '03	Application prototype	Green
ET.2-L.2-LAB.5	1 Aug '03	Initial trial usage by small test group of students	Green
ET.2-L.2-LAB.6	1 Sep '03	Lesson plans complete	Green
ET.2-L.2-LAB.7	1 Sep '03	Applications complete, packaged and ready for delivery and use	Green
ET.2-L.2-LAB.8	1 Oct '03	Effectiveness analysis	Green
ET.2-L.2-LAB.9	1 Oct '03	Evaluation of effort to extend software for additional instruments and specimens.	Green

People

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Partnerships

- KSC Labs and Testbed Office
- KSC Biological Research Office
- KSC Materials Science Department

Technologies

- NASA materials science instruments

Quality Assurance

- Applications will be tested locally in lab and externally by students and educators.

Dependencies

- Availability of instrument expertise
- Availability of software development resources